Monograph on Moderation of Examination Results

RESEARCH CELL
ASSOCIATION OF INDIAN UNIVERSITIES
NEW DELHI

© Association of Indian Universities 1981

Price Rs. 5-00

Published by the Association of Indian Universities Rouse Avenue,
New Delhi and Printed at Pearl Offset Press 5/33 Kirti Nagar,
Industrial Area, New Delhi-110015.

PREFACE

Educators have always been concerned with measuring and evaluating the progress of their students by means of examinations. Right from the beginning the function of examinations has been to provide the information needed for a precise assessment of the outcomes of education. It is widely accepted in almost every university examination that some adjustment of the marks is desirable in borderline cases, when the results of these examinations are prepared. In this research project it is aimed to study the different procedures in which the results are moderated in various universities. The main aim of this study is not only to detail out the current position of the moderation procedures but also to provide a rational and scientific design for the same, to bring it within the frame work of explicitly stated rules and regulations.

Before presenting a scientific strategy for the moderation of examination results, it is felt necessary to give a view of the existing patterns. Although all the universities/institutes were approached in regard to get the information, however, only 45 of them have replied and a brief summary of the same is included in the section II of the monograph. It has been inferred that the existing pattern of the moderation and the award of grace marks are arbitrary, adhoc and unscientific. Section III of the monograph entitled "Grace Marks & Moderation" concerns with very important aspects of the problems. It highlights some fundamental difficulties for the moderation of the results, and also speaks about criterion to decide pass or fail. Apart from this it contains very important illustrations in regard to 'Standard Theory of Measurement', 'Passing Probability'. Finally it gives the details of the requirement of a minimum total and corresponding reduction of the marks.

Section IV of the monograph entitled "Moderation Procedures" deals withthe uniformity of marking procedure and also suggests some ways about randomisation of answer-scripts. A computer programme for the moderation of marks has also been included in the fifth and the last section of the monograph. It is highly hoped that the given computer-programme, which is based on the scientific and statistical probability results will be of great help to find the passing probabilities of the students based on their marks in various subjects or examinations. A collection of references is also given for further use of readers.

Suggestions for improvement of this booklet (in terms of its utility) from examiners, teachers, administrators, and others will be most welcome.

Aug. 23, 1980
New Delhi

V. Natarajan

Foreword

Unlike a large number of academics who put their faith in internal assessment, I have had for years a different opinion. In my judgement, internal assessment in our country can succeed only in certain faculties. There has to be an element of rigorous selection at the time the students are admitted. Secondly, there has to be a good student-teached ratio. If these two preconditions exist, internal assessment can work. The experience of the IITs and agricultural universities proves this point. In addition, internal assessment has been tried in some other faculties also. On the whole, it has worked wherever these pre-conditions have been complied with.

In consequence we in India have no choice to conduct public examinations. The problem about public examination, however, it that a large number of students are involved. This problem has been solved to some extent in a few places, but by and large it still continues to baffle us. In addition, there are a number of smaller problems to which we are yet to find a solution. One is, how to moderate the score of a large number of candidates.

A terms that has gained some currency in recent years, is the term "grace marks". What it really means is that a certain number of marks are added to the score of each candidate. If the pass percentage for instance is '36' and somebody is getting '33', it is customary to add another 3 grac marks. If, it were a question of only one or two or 3 marks, unscientific though it may be, one would put up with it. There have been cases, where as many as 30-40 marks have been added, and this has been done without any rhyme or reason as the proverb goes. There is no system whatsoever about its. Marks are added in order to enable the candidates to pass. If this were the only motivation, one could understand. Sometimes the motivation cannot be this, with the result that several persons responsible for these decisions have had to face enquiries and in a few cases have had to loose their jobs. In certain universities, they have xxx now revised the system whereby the whole thing had been quantified. For instance, in a particular university, the statutory-practice is that 1% of the total marks can be added. But even here there are certain sub-clauses regulating the ceiling as well as the distribution.

The point of referring all these details is that the whole thing is done on ad-hoc and unscientific basis. In this monograph, Prof. V. Natarajan has proposed a scientific basis. If his proposal is effective, it should be censured on that ground. In plain words, somebody should point out flaws in his mathematical reasoning. But if his proposal is scientifically sound, as it seems to be, the logical thing is to accept it and enforce it.

I would refer to only one particular aspect of the proposal. Those universities, which have access to a computer can use the formula easily: those universities, which do not yet have access to a computer, have been provided with another formula with a variant of it, which they can use.

We in the Research Cell attach a lot of importance to these findings. As stated above, the whole thing is worked out on scientific lines. The reasoning is entirely mathematical and is open to any one to question it. But if it is not questioned and the formula is ignored, it would be a triumph of tradition over scientific thinking. What this formula ensures is that "grace marks" or "disgrace marks" as someone put it are given not at random, but in accordance with a certain line, which has taken into account the laws of probability as well as the performance of the individual student.

New Delhi

Amrik Singh
Secretary

ACKNOWLEDGEMENTS

The Examination Research Cell is indebted to the Ministry of Education and Social Welfare, Government of India, for their financial support.

The author is grateful to Dr. Ramaranjan Mukherjee, President, Dr. Amrik Singh, Secretary, A.I.U. for their valua guidance and encouragement.

This Monograph is the outcome of the joint efforts of all those working with the Examination Research Cell. However, th author takes the opportunity to thank Mr. Ved Prakash and Miss Asha Arora, who put in hard work for completing this study.

The author also extends his thanks to Mr. G. Ramakrishnan and Miss Veena Bhalla (Research Assistants), Mr. V.K. Chugh, Stenographer, Mr. Vinod Kumar, IBM Typist and Mr. Mahender Singh and Miss Kavita Kumar, Typists, for their co-operation and help in the publication of this book.

Special acknowledgement is due to Mr. S.P. Julka who has edited the manuscript.

The author is grateful to the monumental and original work of H.J. Taylor et. al in this area.

A word of thanks to the Registrars and concerned administrative authorities of the Universities/Institutions who have supplied the necessary information on the topic.

New Delhi

V. Natarajan

CONTENTS

SECTION I Moderation of Examination Results

SECTION II Development so far

SECTION III Grace Marks & Moderation

SECTION IV Moderation Procedures

SECTION V Computer Programme for Moderation of Marks

Bibliography

SECTION I

MODERATION OF EXAMINATION RESULTS

MODERATION OF EXAMINATION RESULTS

Introduction

Moderation is that important phenomenon which in common parlance has come to mean the award of some grace marks to a candidate in an examination, thus playing a pivotal role in determining the results. The marginal or the borderline cases are given the benefit of the doubt i. e. some grace marks to enable them to pass the examination or to improve the division in case it is missed with a narrow margin. This forms a component part of our examination system and though the universities/institutions are quite conscious of their responsibilities and take every step to ensure their efficient running, it is a saddening fact that most of them are unaware of the scientific system of moderation. Most of the moderation procedures followed by various universities, dealt with in the second chapter of this monograph, are arbitrary, adhoc and unscientific;

The main aim of this monograph is to detail out the present position of moderation procedure and to provide a rational and scientific design for moderation so as to bring it within the framework of explicitly stated rules and regulations; the main thrust being the statement that moderation has to be based on a consideration of passing probabilities to attain objectivity and conviction. The computer programme it carries can be used to find out the passing probabilities of examinees based on the marks in various subjects or examinations.

Borderline cases have always been moderated by the use of a formula i. e. giving some grace marks, which ensures that candidates with the minimum total, do not fail on account of small deficits in one or two subjects. Such a procedure is necessary, state Taylor and Tluanga in their report, to help those students who fail but are better than those who pass. But the need to base the moderation of results on a consideration of the passing probabilities and not on arbitrary 'grace marks', is obviously being felt by different authorities. That is the general conclusion we draw from the information received from different universities. It is clear from the information that most of the universities have not framed any rules or procedures for moderation of examination results. In the case of complaints, the reviewing of the results by the committee of examiners and papersetters before the actual declaration, is the general practice. This committee after reviewing the border line cases, finalises the results which is often arbitrary and unscientific. Finding rational and scientific ways for moderation of examination results is a challenging and crucial problem not only for universities but for the Boards too. It is therefore, necessary to look at the problem in its right perspective

The third section of the monograph deals with the grace marks and moderation and throws some light on their meanings and applicabilities. The fourth section deals with the statistical moderation. This section is an important one and justifies various moderation procedures on the basis of statistical techniques. The fifth section deals with computer-programme for the moderation of examination results. The computer-programme written in this section can be used to find out the passing probabilities of the students based on the marks in various subjects or examinations and decide 'pass-fail' on this basis. The given programme is based on the scientific and statistical probability results and hence is objective. The last and the sixth section The Conclusion gives the overall view of the study. This monograph is therefore, prepared with the hope that it will help all those who are facing the problem of moderation of examination results.

Moderation- A Plan of Action:

Most public examining bodies measure a candidate's performance by assigning a mark to his answer script. Let us take a hypothetical situation. There is a paper of three hours carrying 100 marks and the examiners are asked to award numerical scores while assessing the answer scripts. The mark can range from 0 to 100. This is called the 101 point scale because, including 0, there are in all 101 units of measurement. The implicit meaning of having such 101 steps in marking is that a candidate who scores 46 marks is superior to one who scores 45 marks and so on. Such an inference could be correct if the mark is a "true" mark. Unfortunately, the mark given by an examiner is a "raw" mark subject to several uncertainties (listed below) and needs moderation.

i) The first uncertainty is about the thing to be measured i.e. the candidates' performance. This is invariably ill-defined. The marks may be a measure of the candidate's ability or knowledge or memory or intelligence or power of expression or a combination of one or more of these characteristics. No one really knows what the examiner has really measured. Therefore, the mark assigned may vary from one examiner to another.

ii) The second uncertainity arises from the assumption that there is a true mark for each script. Such a true mark can only be assigned by an ideal examiner who does not exist. The actual examiner at best, makes only an estimate of the true mark. This estimate is therefore, a 'raw' mark and is subject to considerable error. For some typical papers set at universities, experts have carried out a statistical analysis. Such a statistical analysis has shown that when an examiner assigns a mark to a script, there is a 50 percent chance that his error is greater than 5 percent. This means that when a candidate is awarded raw mark of 41, his/her true mark may be either above 46 or below 36 in 50 percent of the cases. Under these circumstances, the 101 point scale where candidates are distinguished in steps of one mark loses all its significance.

iii) It is quite often that certain marks are laid down as the minimum required for passing, for getting a second class or for getting a first class. This arbitrary minimum is meaningless. It may result in candidates who do not deserve a pass passing and vice-versa.

iv) Unfortunately, the public in our country has not been kept informed of the inaccuracies of our current marking scheme. Many of them take the 'raw' mark assigned by an examiner as the 'true' mark and use it for a variety of purposes. Thus a candidate getting 60 percent mark is regarded as superior to a candidate getting 59.9 per cent marks. This causes a considerable measure of frustration.

v) It will be seen from the above that the 101 point scale of marking together with the arbitrary minimum for a first, second or pass class is scientifically unsound. It was adopted when our scientific knowledge about examinations was inadequate. Even with improved information becoming available about the reliability of such marks, we still continue giving marks on the 101-point scale and furnishing these marks to the student. The unscientific nature of this work and the harm it does to the student is really unbearable.

Quite often, there is no systematic marking scheme evolved and agreed upon by all examiners. The first reason is more fundamental and based on the fact that examiners mark on very different standards. One examiner gives 40 where another would have given 20. These large differences between the marks of different examiners were very obvious in previous examinations, there was no way of knowing whether they reflected differences in the standard of examining, or differences in the quality of scripts. There are good colleges and poor colleges and an examiner's scripts may be very much better than those of another. When scripts are thoroughly mixed, each examiner gets a sample reresenative of the whole area, and all the bundles are statistically equivalent. Any differences now found in the level of marking can be safely attributed to the examiners and not to the candidates. It is then possible to scale all marks of candidates to a common scale. No examination can be valid if this condition is not satisfied. unfortunately, this method is not in practice and this causes a great variation in marks students obtain. It has also been observed that in some of the universities Boards, the results are moderated on the basis of provious results. If the percentage of marks in the current year is lesser or greater than the previous results, the responsible members of the University/ Board sit and bridge up the gap which is really arbitrary, unscientific and adhoc.

SECTION II

DEVELOPMENT SO FAR

DEVELOPMENT SO FAR

With a view to collecting information about the existing pattern of moderation procedures for the examination results in the University/Institute, a questionnaire was prepared and circulated. The responses in a consolidated form are given below:

1. Annamalai University

The information received reveals that this university has not yet introduced the system of moderation of results

2. Banaras Hindu University

This university has also not yet introduced the system of moderation of results

3. Bangalore University

The moderation of marks at this university is considered only when the percentage of results is very low and that too based on the recommendations of the Chairman, Board of Examiners concerned. Usually moderation is not considered as a regulation or rule.

4. Bhavanagar University

This University is at present in a preparatory stage and has not yet started taking examinations.

5. University of Bombay

This university does not have the provision of moderating the examination results. However, meetings of the Chairman/ Senior Examiners are convened for finally settling the results. In these meetings, the resolutions regarding granting of grace marks to the students for passing as well as for the award of class, are made.

6. The University of Burdwan

The information received from this university reveals that the Head Examiners in the subject re-examines the scripts of the candidates obtaining marks between 23% and less than 33%. The result of such re-examination is taken into account while determining his result.

The result as prepared by the tabulators is placed before the Honours Result Committees for consideration of the results in Honours subjects and before the Pass Result Committees for consideration of the result of examination as a whole. The Honours Result Committee is constituted of all the examiners in the Honours subject and the Pass Result Committee is constituted of the Chairman in the different pass subjects with some other nominees of the Vice-Chancellor. The results with the recommendation of these Committees, if any, are finally placed before the University Council for consideration. The results are then finalised after modification, if any, as per direction of the university Council.

7. University of Delhi

The examination results at this university are moderated by the Moderation Committee appointed by the Academic Council for the purpose and there are no prescribed rules or ordinances for moderation of results.

8. Guru Nanak Dev University, Amritsar

This university does not have any prescribed rules and regulations for the moderation of the results. However, the Chairman of the Board of Studies considers and determines the cases, in consultation with the examiners, if any, as per university directions. Provided that if the Board of Studies and the Examiners are not able to agree upon the courses to be adopted, the decision of the Board of Studies shall be subjected to the confirmation of the Vice-Chancellor and if the Vice-Chancellor does not confirm the decision of the Board, the matter shall be referred to the Syndicate whose decision shall be final.

9. Himachal Pradesh University, Simla

The information received from this university reveals that the following ordinances are used for the moderation of the results.

1. For calculating pass marks prescribed in these Ordinances various examinations, every half mark or more shall be rounded off to the next higher whole number and shall be ignored if it is less than half.

2. (a) A candidate, who appears at an examination, but fails in one or more courses/subjects (written, Practical, Sessional or viva voce) and/or the aggregate (if there is a separate requirement for pass in the aggregate), shall be given grace marks upto one percent of the total marks allotted to the course (s)/subject (s) in which he appeared, to enable him to pass the examination. While awarding grace marks, the fraction working to half or more will be rounded off to the next whole number:

Provided that in the case of M.B.,B.S. examination, the grace marks shall be given up to 1% of the aggregate of each subject and shall be awarded subject-wise.

Provided further that grace marks shall not be awarded in more than one subject in the case of First Professional M.B.B.S. examination and more than two subjects in the case of Second and Final Professional M.B.B.S. examinations.

(b) Grace marks upto 1% of the total aggregate marks may be awarded to a candidate, who has passed an examination but has failed to obtain either the Second or the First Division, if by the addition of such grace marks, he is enabled to be placed in the Second or the First Division, as the case may be:

Provided further that at the post-graduate level the grace marks will only be given at the completion of the full course consisting of all parts.

Provided that grace marks shall not be allowed to a candidate to improve his division, if he has already been allowed grace marks to pass the examination or any Part thereof, or to a candidate who is permitted to re-appear in an examination to improve his division or score in a course under paragraph.

A candidate who does not fulfil the percentage required for admission to Master's degree course may be allowed to improve his score in only one subject/additional subject of his choice, only once within two years from the passing of the respective examination:

Provided that this concession shall be for the purpose of eligibility for admission to a course for which graduation is minimum qualification for admission.

10. University of Hyderabad

This university does not have any moderating procedures for the examination results. The final results at the end of all the semesters prescribed for a course of study are given in the form of cumulative Grade Point Average. These are considered by the 'Committee of Examinations" consisting of Deans of the Schools and are approved by the Vice-Chancellor before being announced. So far, necessity of adopting any moderating procedures has not been felt. These rules may be framed in course of time in case it becomes necessary. It may, however be pointed out that the university has only post-graduate courses like, M.A., M.Sc., and M. Phil. and at present there are no undergraduate courses.

11. University of Indore

This university also does not have any set plan for moderating the examination results. The Result Committee consisting of - the Chairman, Dean of the Faculty concerned, one of the Chairman Board of Studies, one of the Tabulators /Coordinator/one Professor and the Registrar member Secretary, scrutinise and pass the results of examinations conducted by the university after satisfying itself that the results on the whole and in various subjects are in conformity with the usual standards and to recommend to the Kulpati the action to be taken in any case where the result is unbalanced.

12. University of Jammu

This university follows a re-evaluation procedure of answer-books in connection with moderating the examination results of Degree classes, Post-Graduate classes and L. L. B classes. In other examinations no measures have been adopted for moderation of the results. The following rules are considered for the same:

I No re-evaluation shall be permitted in the practical examinations held in different subjects, internal assessment, project reports, dissertations, thesis and viva-voce.

II If a candidate feels that his answer book(s) has (have) not been fairly evaluated he may apply for re-evaluation of the same.

III In the case of under-graduate examinations there shall be a Committee in each subject of examination nominated by the Vice-Chancellor for scrutiny and disposal of cases relating to re-evaluation of answer scripts. The Committee shall have three members. Two members shall form a quorum.

IV The Committee shall examine the script of the candidate in relation to the standard of evaluation as adopted by the examiner and shall have authority to dispose of each case on merits as it may deem fit. In the event of a majority decision by the Committee certifying a necessity of re-evaluation, the script of the candidate concerned shall be sent for re-evaluation to two examiners to be appointed by the Vice-Chancellor, both of whom shall be from outside the state. The examiners shall re-evaluate the script independently keeping in view such directions as may have been supplied for evaluation to the original examiner.

V The results of the re-evaluation shall be worked out by taking into account the average of the two highest scores out of the three awards including the original award.

VI The effect of the re-evaluation shall be given where the character of the result is changed or where on re-evaluation the score increases or decreases by 8 percent or more of the maximum marks allotted to the concerned paper.

VII No further re-assessment shall be allowed after the award by two examiners on re-evaluation has been received. The result of the re-evaluation whether favourable or unfavourable shall be binding on the candidate who applied for re-evaluation.

VIII If as a result of re-evaluation, a candidate passes in the examination he shall be eligible to seek admission to the next higher class within ten days of the communication of re-evaluated result to him. In such cases his attendance and internal assessment shall be counted from the date of admission.

13. University of Jodhpur

This university has not framed any detailed rules for the moderation of examination results.

14. Kumaun University-Nainital

The university has also not adopted any method of moderating the examination results.

15. Kurukshetra University, Kurukshetra

This university has recently taken a decision with regard to the moderating procedure for university examination results.

According to this decision, if on scrutiny of the pass percentage it appears that there has been distinct change of standard in the examination as a whole or in a particular subject, the matter shall be submitted to the Vice-Chancellor who may refer the matter to the examiners concerned for report or may take such action as he may consider necessary.

16. The M. S. University of Baroda

This University follows the following system for the moderation of the examination results:

(i) A candidate whose total falls short of the requisite total for a First or Second Class or Honours or Distinction by 1, 2, or 3 marks shall be given the necessary marks by which his total falls short and declared to have passed with First or Second Class or Honours or Distinction as the case may be. This rule shall also apply for awarding Distinctions in individual subjects to candidates appearing at the I, II and

III M.B.B.S. examinations provided they pass in all subjects at the same time, at the first attempt.

(ii) (a) Where a candidate at a University Examination, fails in only one head of passing by not more than 2 marks, where the total of that head (subject) is less than 100; by not more than 3 marks where the total of that head is 100; or by not more than 4 marks where the total is more than 100 but not more than 200 or not more than 2% of the total of the head where that total is more than 200; such failure shall be condoned subject to the maximum of 8 marks.

(b) Where a candidate fails in two heads of passing and the total of his deficiency in marks in the two heads taken together does not exceed the maximum number of marks condonable in the head of passing in which the extent of failure condonable is higher in accordance with the basis of condonation laid down in (a), his failure in each of the two heads shall be condoned to the extent of condonation permissible in the respective heads under the said ordinance.

(c) If a candidate fails in a head of passing which is included in another head of passing, he shall be entitled to the benefit of condonation in both the heads, if necessary, subject always to the maximum of marks prescribed in (ii) (a) above.

(d) Notwithstanding what is stated above, if the standard of passing in the different subjects at the examination is 50% or more, condonation to the extent mentioned in para (a) shall be given in more than one subject.

(iii) Where a candidate who appears in all the subjects of a University Examination, fails in one or two heads of passing and where the total deficiency in his marks in one or both the heads taken together is not more than 10 marks his deficiency in marks in the head or the two heads of passing taken together shall be condoned on the basis of one mark for every one per cent by which the total marks secured by him in all the subjects exceed the total of the minimum marks required for passing in all the subjects.

For the purpose of condonation half a mark or more than half shall be computed as one mark.

This Ordinance will also be applicable to the cases of candidates appearing in compartments at the examination at which a minimum percentage is prescribed for passing in the grand total and where the marks obtained by the candidates on the earlier occasion are carried over for the purpose of deciding whether the candidates have secured the minimum percentages of marks in the total required for passing.

(iv) The results of all the University Examinations before declaration be submitted before adhoc Committee consisting of the following members:-

(1) Pro-Vice-Chancellor
(2) Persons appointed by the Syndicate
(3) Dean of the Faculty concerned
(4) Head of the Institution concerned, and
(5) Registrar (Member Secretary)

Who shall consider the results and make recommendations to the Vice-Chancellor for finalising the results. The decision of the Vice-Chancellor on the Committee recommendations shall be final.

(v) (a) A candidate whose failure is condoned under this Ordinance shall be eligible for classes in the same way as other successful candidates but not for scholarships and other awards.

(b) A candidate will not be allowed the benefit of this Ordinance to enable him to earn exemption, but he will be entitled to the benefit of condonation to enable him to keep terms in a higher class.

(Note: The expression head of passing" shall be deemed to include the aggregate of marks in an examination, where a candidate is required to obtain a certain percentage of the aggregate marks in order to be declared successful).

17. Maharshi Dayanand University, Rohtak

No pattern has been adopted at this university to moderate the examination results. In case there is any complaint in any paper as being out of syllabus/course or as a stiff paper, the same is looked into by the complaint committee and a few grace marks are given, if considered necessary.

18. University of North Bengal

1 The academic considerations, the University subscribes to do not provide any preplanned programme to moderate results of its examinations in all the faculties as a post-publication procedure.

2. The University views that although evaluation of students is basically not divested of human factor and as such there remains scope for subjectivism that may eventually vitiate the objective character of assessment, the laid down procedure if properly followed can minimise the subjective element with all its calculable draw-backs.

3. This University has been following a pattern of moderating examination results at the Pre-publication stages.

   (a) At the pre-publication stage no student is allowed to suffer for failure by a margin of 1% marks in any individual subject.

   (b) In case of failure in one and only one subject, the element of chance of the individual student's suffering from any possible vagaries or mischange of subjectivism, is minimised as the candidate s paper in the failed subject is sent for re-examination by the Chairman/Convener/ Head Examiner/ as the case may be. This is considered to be a moderating influence and a safeguard of objectivity.

4. At the post-publication stage the steps of moderating results are (a) post-publication scrutiny and (b) re-assessment of papers. These steps, it has been found through practice both ensure justice to the failing candidates and ensure credibility.

   Apart from these, the University maintains a double check on the evaluation of the scripts at the under-graduate Honours and Post-Graduate Examinations by getting the scripts valued by two examiners and thereby eliminating chances of subjectivism.

Taking all things together, the university has been maintaining all the checks and balances which have been found to hold good a moderating influence on the examination results.

19. University of Poona

The system of moderation of assessment of answerbooks will be operative in the written examination only in all the subjects at the Pre-Degree Examination, irrespective of the number of candidates offering the subject. However, the system of moderation of assessment of answerbooks in the practical examination in the science subjects at the Pre-Degree Examination does not exist.

INSTRUCTIONS REGARDING SETTLING OF MARKLISTS

1. The marklists in a subject shall be settled finally at a meeting of the moderators appointed in a subject. The meeting for this purpose shall be convened by the Senior Moderator.

2. When there is only one moderator and only one examiner in a subject, the marklists shall be settled by correspondence and no meeting for this purpose is necessary.

3. If, in any subject, there is only one moderator and two or more examiners, a meeting for settling the marklists shall be permissible at which the moderator and the senior-most among the examiners shall be present.

4. In Physics, Chemistry and Biology, after settling the marklists in Theory, there shall be a meeting for finalising the marklists in theory and practical together, for each subject, at which the moderators in the subject and the Chairman and two examiners in order of seniority from the Board of Examiners in Practical, shall be present.

5. The Senior Moderator will preside over the joint meeting.

The figures showing the total marks below the standard of passing, obtained bycandidates in the written examination shall be underscored by the moderators and if any gracing is decided upon at the meeting, the marks graced should be added and the total be taken to show the marks obtained after gracing; for example, if a candidate gets 30 marks and 5 marks are to be added as grace marks, the entries should be shown as 30 + 5 = 35. The gracing should be invariably initialled by one of the moderators.

6. The Senior Moderators, after finalising the marklists, shall supply to the Registrar, while submitting the marklists in the subjects, a statement giving the percentage of passing in the subject.

7. The Senior Moderators, jointly with the moderators and examiners working under them, shall submit, along with the marklist, a report on the performance of candidates in the subject at the examination.

8. The Senior Moderator, in consultation with the other moderators in the subject, shall also submit to the Registrar, at the time of submitting the marklists, a short report on the work of moderation and shall also point out difficulties, if any, he has come across in the work of moderation and offer suggestions if any.

20. Punjabi University, Patiala

As per rules obtaining at this university, before the results are declared, the results, alongwith percentage of passes in the whole examination and in each subject, for the current and preceding year/years are submitted to the Vice-Chancellor for scrutiny. These rules have recently been modified as follows:

Before the results are declared, the results alongwith a statement of percentage of passes in the whole examination and in each subject, for the current and the proceding year/years would be put up to the concerned Committees consisting of the following:

I. Post-Graduate Examinations

1. Vice-Chancellor or his nominee
2. Chairman, Board of Studies
3. Any University Professor/Principal nominated by the Vice-Chancellor.

II. Under Graduate Examinations

1. Vice-Chancellor or his nominee
2. Dean, Academic Affairs,
3. 2-3 Professors/Principals nominated by the Vice-Chancellor
4. Chairman, Board of Studies in the subject where there is a complaint.

If, on scrutiny of the figures submitted, the Committee considers that there has been a distinct fall in the pass percentage in the whole examination or in a particular subject, it might refer the matter to the examiners concerned for a report or suggest a specific modification of the results or take any other action it considers necessary.

21. University of Rajasthan, Jaipur.

There is no practice of moderating the examination results in this university.

22. University of Roorkee

This university does not moderate the examination results. The examination results are tabulated by the Tabulators, appointed for the purpose and put up to the 'Results Committee' for consideration. The members of the Results Committee are as follows:

1. Vice-Chancellor

2. Pro-Vice-Chancellor
3. Head of the Department concerned
4. Senior Tabulator
5. Registrar

After the results are approved by the Result Committee, the results are declared by the Registrar and then reported to the syndicate after incorporating in the annual report.

23. Shivaji University, Kolhapur.

There is no moderation in this University of the answer sheets assessed by the examiners. The results are prepared by office itself.

24. S.N.D.T. Women's University, Bombay.

This university has not framed any rules for moderating the examination results in the different faculties and subject areas. The general practice is to consider the results before they are declared by a committee of examiners and paper setters. This Committee reviews border line cases and finalises the results.

25. South Gujarat University, Surat.

This university has also not supplied any information regarding the moderation of examination results.

26. S.V. University, Tirupati

This university moderates the examination results on the recommendation of the Chairman of the Board of Examiners for the various courses as follows:

A. The following general recommendations are made regarding moderation of the results relating to II year B.A. and B.Com. degree examinations:

It is resolved to recommend that the marks not exceeding six (i.e. one percent of the total marks) be added to one or more papers in parts I and II subject to the condition that not more than five marks are added to any one paper.

B. The following general recommendations are made on the same topic for II year B. Sc. Degree Examinations.

It is resolved to recommend that the marks not exceeding seven or eight (i.e. one percent of the total marks) be added to one or more papers in parts I and II subject to the condition that not more than five marks are added to any one paper having a maximum mark of 100 and four marks to any one paper having maximum marks of 75.

C. The following general recommendations are made for III year B.A. Degree Examination:

It is resolved to recommend that the marks not exceeding six marks (i.e. one percent of the total marks) be added to one or more papers subject to the condition that not more than five marks added to any one paper.

D. The following general recommendations are made for III year B. Sc. Degree examination.

It is resolved to recommend that the marks not exceeding eight or nine (i.e. one percent of the total marks) be added to one or more papers subject to the condition that not more than five marks are added to any one theory paper and four marks to any one practical.

E. The following general recommendations are made for III year B. Com. Degree Examinations.

It is resolved to recommend that the marks not exceeding six marks (i.e. one percent of the total marks) be added to one or more papers subject to the condition that not more than five marks are added to any one paper.

F. Re-Organized B.A. Degree Examinations Sept-Oct., 1978:

Resolved to recommend that one percent of the total marks i.e. marks not exceeding 3 be added to the aggregate to enable border line candidates to pass the examination.

G. **Re-Organised B. Sc. Degree Examinations Sept.-Oct., 1978.**

Resolved to recommend that one percent of the total marks i.e. marks not exceeding three be added either to the theory minimum or to the practical minimum or to the aggregate to enable border line candidates to pass the examination.

H. **For the Civil, Mechanical and Electrical Engg:**

In all cases where the candidate is failing for want of one mark, one mark maybe added to the candidate to enable him to pass in one paper or in whole examination.

I. **For B.Ed. Courses:**

Resolved to recommend that grace marks of 1% of the total marks of the subjects for which the candidate has appeared, subject to a maximum of 3 marks in any individual paper either in Theory (external assessment) or in the aggregate maybe added.

J. **For M.Sc.; M. A; M. Com; Courses**

Resolved to recommend an addition of four marks to the aggregate or one mark to the paper minimum to help the border line cases.

K. **For B.G. L/B'. L. /Examinations**

Ist year Examinations: For award of grace marks to candidates who have taken the Ist year examination the following guidelines may be followed:

(i) For deficiency in the general total not more than 1% of the grant total i.e. 6 marks may be awarded.

(ii) For deficiency in paper minimum not more than 2 marks may be awarded.

(iii) If there is deficiency in more than one paper and percent of the grand total i. e. 6 may be spread over three papers, subject to the candidate that not more than two marks are added in one paper.

IInd Year Examination:

(i) For deficiency in the general total not more than 1% of grand total i.e., 7 marks may be awarded.

(ii) For deficiency in paper minimum not more than 2 marks may be awarded.

(iii) If there is deficiency in more than one paper 1% of the grand total i. e. 7 marks may be spread over three papers, subject to the condition that not more than 2 marks are added in one paper.

Final year: (III year)

(i) For deficiency in the general total not more than 1% of the grand total i. e. 7 marks may be awarded.

(ii) For deficiency in paper minimum or in exemption not more than 2 marks may be awarded.

(iii) If there is deficiency in more than one paper, one percent of the grant total i.e. 7 marks may be spread over three papers subject to the condition that not more than 2 marks are added in one paper.

27. Assam Agricultural University, Jorhat

This university follows semester system of teaching and examination with the provision of internal evaluation. There is also provision of comprehensive examination conducted by a Committee with, besides other members, some external examiners. Besides the thesis submitted by the students for Masters' Degree Programmes are examined by an external examiner.

28. The University of Agricultural Sciences, Bangalore

The trimester system of education is in vogue in this university. Under this system, the teacher who offers the course himself conducts the examination, evaluates the answer scripts and awards the grades. Hence the question of moderation of examination results does not arise.

29. G.B. Pant University of Agriculture and Technology, Pantnagar

This University follows internal assessment system. The following uniformity of standards for examinations is maintained:

1. When a course is being taught by more than one Instructor the common course work, evaluation, grading and final marking should be on a common standard for all the examinations. They should mutually consult each other and the Head of the Department and the Dean in this regard.

2. When more than one Instructor is teaching the same subject to the same class in various groups, they shall maintain the uniformity of standards for the same class and for the same course examined at the same time through a common examination conducted by all the Instructors together and grades given on the basis of consensus. If the instructors are unable to reach the consensus, they shall give marks separately according to their own judgement. The grades shall be based on the average of the marking by all the Instructors.

3. (a) If a Head of the Department is satisfied or has reasons to believe that marking/grading in a particular course has been abnormal, he shall submit a detailed report to the Dean of the College concerned recommending re-evaluation or re-assessment of the answer books giving full details of the reasons for his belief that the marking/ grading has been abnormal.

   (b) On receiving such a report, the Dean, after such an enquiry of checking as he may deem proper, pass necessary orders on the report.

   (c) In case, the Dean is satisfied that there is a prima facie case and the grading has been abnormal he may order re-assessment of the answer books with the approval of the Vice-chancellor.

   (d) In case, however, the Dean feels that there is no prima facie case and there has been no abnormality in marking/

grading of the answer books he may communicate the same to the Head of the Department and submit a report accordingly to the Vice-Chancellor.

(e) In case the Dean is satisfied that there is a prima facie case he shall appoint a committee for re-assessment and re-examination of the answer-books with the approval of the Vice-Chancellor, The Committee shall consist of 3 to 5 members, the majority of whom shall be of the same specialisation in which the answer books are to be re-examined. The Committee shall submit its report within a week from the date of receiving such a reference. Among other things, the committee shall specifically report whether the grading/marking has been uniform or whether there has been any abnormality in marking/grading from student to student and also whether in the opinion of the committee the abnormal variation has been because of negligence or of any malafide intentions.

(f) If as a result of re-evaluation/re-examination of the answer books it is found that the marks awarded by the instructor are not significantly different there should be no change in the marks/grades.

(g) In case, however, it is revealed that the variation in the marking/grading as reported by the committee and as done by the instructor is significant, the marks awarded by the committee shall be treated as final. Consequent change (s) in grades as a result of re-marking of the answer books shall be effected after the approval of the Vice-Chancellor.

(h) All re-assessment or re-evaluation that may be necessary shall be completed within two weeks of the date of registration in the following trimester, except in case of final trimester students who are to complete their degree in a particular trimester when it should be completed within a week from the date of registration in the following trimesters after which all such cases shall be treated as closed and no re-evaluation shall be done under any circumstances.

SCRUTINY

(a)

1. If any student desires scrutiny in any course, he shall be permitted to do so without any scrutiny fee.

2. He shall have to file an application on the prescribed form, which can be obtained from the office of the Registrar.

3. After having the approval of the Registrar, he will present the form to the Instructor concerned.

(b)

Scrutiny means checking of marks, examination of questions left unmarked and re-assessment of the question(s) already marked.

(c)

Answer-books of the trimester final examinations shall be returned by the Instructor concerned to the students on the day following registration in the following trimester.

(d)

Applications for scrutiny of results shall be entertained upto seven days after the return of the trimester final examination answer-books to students, after which no such application shall be entertained.

CHANGE OF GRADES AS A RESULT OF SCRUTINY

After the grade has been revised as a result of scrutiny, the Instructor will send the grade, with reasons under which the grade has been revised, through his Head of the Department to the Dean who will examine and forward the same to the office of the Registrar. All such grades revised as a result of scrutiny will be forwarded to the Vice-Chancellor after the last date of scrutiny. Necessary correction in the student's report card would be made after the approval of the Vice-Chancellor is received.

RETENTION OF THE EXAMINATION ANSWER BOOKS

1. Instructors must retain the answer books with them till at least the last date for revision of the grades was over and show the answer books to the student to understand their mistakes after the commencement of the next trimester.

2. The instructors shall announce the date, time and place for showing the trimester final examination answer-books to the students, after re-opening of the University in the following trimester, in the last lecture of the class. Any change in the date so fixed shall be notified to the students immediately after re-opening of the University in the following trimester.

3. After the last date for revision of the grades was over and the answer books had been shown to the students, the instructor may pass on the answer books to the Head of the Department concerned for disposal.

4. Marks obtained by students in quizzes, hourly examination and trimester final examination, should be shown to students, explaining the mistakes commited by them and the reasons for deducting marks. In the case of trimester final examinations, the instructors shall retain the answer-books with them for returning them to the students at the commencement of the next trimester.

30. Gujarat Agricultural University

This university does not have any moderating procedures of the examination results.

31. I.A.R.I.,New Delhi

The Institute follows the course-credit system on the model adopted in the different universities of the U.S.A. Courses are organized as discrete units or blocks of subject matter. The courses are assigned a certain number of credits. One credit represents (a)approximately12 hours of lectures(one hour per week for 12 weeks), the necessary reading and preparation outside the class required for mastery of the subject-matter fields covered in such a course of lectures, or; (b) approximately 12 practicals of normally 3 hours' duration each. Each course, in general is so planned that it can be completed within a given term. The number of credits of course work required for each candidate is specified by the Advisory Committee of the student and approved by the Dean.

Instructors judge and grade the student's performance and their mastery of the material covered in the various courses by a system of quizzes, term papers, mid-term and a final examination at the termination of the course which is held at the end of the trimester. The answer books for all the examinations may be seen by the student who is free to discuss with the instructor regarding his performance and grading.

32. Jawaharlal Nehru Krishi Vishwavidyalaya, Jabalpur

This Vishwa Vidyalaya does not have any moderation procedure for the examination results.

33. Kerala Agricultural University

This University is following trimester system of education and giving O.G.P.A. in the 4 point system and is not having any moderation procedure for the examination results.

34. Konkan Krishi Vidyapeeth, Dapoli

This university has adopted the semester system of education under internal evaluation system of education. In this system the evaluation of a student in each course is made in terms of a grade. Each teacher incharge of a course, shall grade a student based on the marks obtained by the student in that course in accordance with the scheme of evaluation notified by the teacher in the begining of the semester. The teacher will send the final grade list through the Head, Department/section to the Associate Dean within the specified period after completion of the final examination. The Associate Dean will consolidate the same and submit to the univarsity office for declaration of results. The answer books of all the examinations are returned to the students by the concerned teacher as soon as evaluation is over.

35. Orissa University of Agriculture and Technology, Bhubaneswar.

This university has adopted semester system of teaching and examination based on internal assessment and grading. As such there is no provision of moderation of examination results under this university.

36. Punjabrao Krishi Vidyapeeth, Akola.

Evaluation of answer books is made by the course teacher and Heads of Departments concerned. The Registrar will get the marks tabulated and totalled for each course and place the result for consideration of Results Committee which will finalise the grades for each course. Grace marks to the extent of 2% of the total in a particular course/courses will be awarded by the Results

Committee to the students who lose the higher grade by that much margin. The Results Committee will also scrutinise the cases of the candidates who had submitted the declarations. When the grades are finalised by the Results Committee the grades should be tabulated college and coursewise and G. P.A. and C.G.P.A. calculated for final results.

37. Tamil Nadu Agricultural University, Coimbatore.

In this University the trimester course credit system with cent percent internal assessment is being followed and there is no moderation of examination results.

38. Central Institute of English and Foreign Languages, Hyderabad.

The results of the examinations of this Institute are approved by the Examination Committee before they are published. There is no moderation.

39. Dakshina Bharat Hindi Prachar Sabha, Madras

This is a Post Graduate Department. There is no third class in M.A./R.B. Parangat. Pass mark is 50%. The system of double valuation is followed. Each paper is sent to two examiners. The examiners are not allowed to mark on the papers. An average of the two valuations is taken.

Moderation of the P.G. examination result is done on the following lines.

1. Every candidate must get 45% in each paper and 50% in the aggregate in order to pass.

2. If a candidate gets lower than the prescribed marks for a pass in individual papers or in the aggregate, the Board of Examiners give 5 marks grace to such a candidate. These 5 marks may be added to the individual paper or to the aggregate.

3. Failed candidates can apply for scrutinising (retotaling) of their marks, by sending Rs. 5/- to the Registrar.

4. If there is difference of more than 20% marks between the

two valuers of the same paper, the Chairman of the Examination Board himself does the third valuation or gets the same done by some Board member and that is accepted as final.

40. Tata Institute of Social Sciences, Bombay

This Institute does not have the system of moderating the examination results for Post-graduate Programmes M.A. in (i) Social Work and (ii) Personnel Management and Industrial Relations. However, there is a provision of supplementary examinations which are arranged within a fortnight of re-opening after every semester recess.

Students work will be evaluated under the seven point grade system (O, A, B, C, D, E & F) adopted on the directive of U.G.C. The grade point average for a semester/year programme will be calculated by $\sum\frac{GC}{C}$, where G is the point equivalent of the grade obtained by a student in a course and C is the number of Credit hours of the course. The following are the important points to be considered for the same.

I. To pass an examination a student should get at least a 'D' grade in individual courses and should maintain a minimum grade point average of 2.5 in each semester.

II. A student who is awarded an E or F grade in an individual course will be considered to have failed in the course.

III. Only a student who has failed in not more than two courses in one semester will be eligible to appear for a supplementary examination in those courses.

IV. A student failing in a course will be allowed to appear only for one supplementary examination.

V. A student failing to get a minimum grade point average of 2.5 in the first/third semester will be allowed to continue his study for the second/fourth semester but will be expected to make up for his deficiency and achieve the required grade point average by the end of the second/fourth semester by obtaining better grades in other courses.

VI. A student if he so desires may also take an additional examination in courses (excluding field work) in which he has obtained a D grade to improve his grade point average. However, such an additional examination will be given only during the period of arranged by the Institute of supplementary examination of that semester.

VII. A student who fails to attain a minimum grade point average of 2.5 even after taking the additional or supplementary examination will be considered to have failed in the whole examination.

41. Indian Institute of Technology, Bombay

This Institute follows the continuous evaluation credit system according to which students have to obtain pass grade in each and every course prescribed for the B. Tech./M. Tech. programme. Hence the question of moderating the examination results of an individual student does not arise while finalizing the examination results.

42. Indian Institute of Technology, Delhi

The following are the points to be taken into account for moderation procedure as approved by the Senate:

1. Moderation as under the old system need not be followed.
2. The guidelines for evaluation under credit system may be followed by the teachers.
3. The results for 300, 400 and 500 level courses before being finalised should be reviewed in a meeting of a Departmental Committee with the Head of the Department or his nominee as the Chairman and teachers as members. For I and II year the discussion with regard to distribution of grades should be with the Dean, undergraduate studies.
4. Final decision with regard to grades should rest with the teacher concerned.
5. If a course is offered by a Department for any other Department(s) the discussion will be held in the Department where

the course is being taught and representative(s) on whose behalf the course is being taught, will be invited to the discussion meeting.

43. Indian Institute of Technology, Kanpur

At the conclusion of a semester, a student is awarded a letter grade in each of the courses he has taken during the semester. The grade awarded to a student depends on his performance in the various examinations, in home assignments, in laboratory work, the regularity of his attendance etc.

There are five regular letter grades - A, B, C, D & F. A student may also be awarded (P) grade.This grade will have no grade points and will not affect the performance index. A student may be awarded a grade 'I' (incomplete) if he has not been able to complete the examination on medical grounds only. When a student gets a grade of 'I', it is the responsibility of student and teacher to get in touch with each other and make arrangements for adjusting the grade before the date of registration of the succeeding semester. Failure to do so results in an automatic 'F'. Only one make up examination will be given.

If a student feels that the grade awarded to him is not correct he may apply for rechecking of his answer script through proper channel. The result of rechecking will be communicated to the student in writing.

44. Indian Institute of Technology, Kharagpur

There are no rules laid down regarding moderation of examination results of this Institute. The results of examinations as recommended by the Board of Examiners and the Results Review Committee (recently replaced by Undergraduate programme and Evaluation Committee) are considered by the Senate. The Senate has the power to deviate from the provision of regulations with regard to examination standards and also to refer back the cases of hardship to the Boards of Examiners and the Results Review Committee for being scrutinised again.

45. Indian Statistical Institute, Calcutta

In the Institute the pattern of moderating the examinations is as follows:

In the annual examinations for the degree courses the question papers are moderated by a board of moderators consisting of all the examiners in a subject area together with an external expert who chairs the board. The Institute provides the letter grade which is given on the basis of a percentage mark obtained by pooling marks from about four examinations held over an academic year. Normally if the addition of one mark changes the letter grade then that mark is awarded to the student. More than one mark is awarded only in cases where such addition would mean pass from fail, first division from second division, etc.

SECTION III
GRACE MARKS & MODERATION

GRACE MARKS & MODERATION

The concept of examination is as old if not older than the concept of learning. Ever since, examination has come to be regarded as an inevitable part of teaching/learning process. Of its many functions, some are; it helps to assess every students' performance as a result of learning; it enables to secure various jobs and entry into further courses of study.

Eventhough substantial amount of work has been done to improve various aspects of the examination system, very little work has been done regarding the moderation of the examination results. It is generally agreed that in the university examinations, if not in service Commission examinations some adjustment of the marks is desirable in borderline cases, when the results of these examinations are prepared. In almost every university examination, some grace marks are given to borderline cases, to enable them to pass the examination or to improve the division. The award of grace marks is often arbitrary and adhoc. Besides, the information received from various universities regarding the moderation of their examination results reveals, that in most of the universities it is considered only when the percentage of results is very low. It will not be an exaggeration to say that the way the results are moderated, is arbitrary, adhoc and unscientific. Usually it is based on the recommendations of the Chairman, Board of Examiners and Head examiners etc. and is not considered as a regulation or a rule. Usually in meetings to moderate results, resolutions regarding granting of grace marks to the students for passing as well as for the award of class, are made. Our information reveals that in most of the universities the results are moderated by the moderation committee appointed by the Academic Council for that purpose and there are no prescribed rules or ordinances for this.

In some universities, the system of double valuation is followed. Each paper is sent to two examiners and they are not allowed to mark on the papers. An average of these two valuations is taken. In certain other universities, two examiners are appointed to mark the same scripts independently. When the marks given by these two examiners differ widely, a third examiner is appointed and the average of the two marks which are closer to each other, given to the student. In some institutions the continuous evaluation credit system is in practice, according to which students have to obtain pass grade in each and every prescribed course. In case of complaints, the matter is looked into by a "Complaints committee" and some grace marks given if considered necessary. There is no set plan for giving these grace marks. In some universities the grace marks to the extent of 2% of the total in a particular course/courses are awarded by the Result Committee to the student who loses the higher grade by that margin. It has also been found that a few universities follow a re-evaluation procedure in connection with the moderation of examination results. For this, the Committee appointed, examines the script of the candidate in relation to the standard of evaluation as adopted by the examiner and has authority to dispose of each case on its merits. In the case of a majority decision of the committee certifying the necessity of a re-evaluation, the script of the candidate concerned is sent for re-evaluation to two examiners appointed by the Vice-Chancellor. The examiners re-evaluate the script independently keeping in mind such directions as may have been supplied when sent for evaluation to the original examiner. The results of the re-evaluation are worked out by taking into account the average of the two highest scores out of the three including the original award.

But the fact remains that most of the universities have not framed any rules for moderation of the examination results in different faculties and subject areas. In case of a complaint, the general practice is the consideration of results before they are declared by a committee of examiners and paper setters. The committee reviews the borderline cases and finalises the results. The present problem is not only a challenge for the universities but a crucial problem for the Boards too. Everybody is familiar with the fact that grace marks are always added and they are never subtracted. It may seem an undesirable thing to subtract a mark from a candidate's score. If a student secures 32 marks out of 100, everybody accepts the possibility that he/she may deserve 33, and gives him/her the odd mark, but is not willing to admit the equally clear possibility that the student with 32 may deserve only 31. It is difficult to accept that a candidate should fail by only a mark or two. It is therefore, necessary to prepare a rational and scientific design at national level for the moderation of the examination results. The problem requires deep consultations not only at the university level but also at the national level. The Research Cell of the Association of Indian Universities is engaged in finding out some fruitful solution to this problem.

Fundamental Difficulties in the Moderation of the Results

The main draw back of moderation of examination results is that, it is based only on adhoc, arbitrary rules. There may be rules but they are not scientific and rational. Consider for instance the rule, that a candidate who has an excess of twenty in the aggregate be given up to three grace marks in a particular subject. But if we were to ask why an excess of twenty and not thirty is required, no reasonable answer is possible. The rule has no scientific basis. Another objection may be apparent from the name 'grace' mark, which suggests that it is an act of compassion and not based on sound reason.

Criterion to be used to decide Pass/Fail

Let us look at the criterion by which we normally decide whether a student passes or not in a particular examination. In a system that has been in existence for long, we accept marks as they come from different examiners and decide a student's pass or failure on the basis of his obtained mark above or below a predetermind cut off point (like 35). This happens in every subject. Sometimes a total is obtained of all marks obtained by a student in all subjects and a minimum total is required for him to be declared having passed the examination. Atleast one thing can be said of this; there is no ambiguity about it, if a student in one subject gets 1 less than the passing minimum, he is declared 'failed'. There can of course be a serious objection to this. We treat examination scores as absolute measures. This is wrong. The mark is associated with many errors and uncertainties.

Suppose a student's true mark (related to his ability) is just above the pass line in all subjects except one where he is under estimated, he then fails the examination. But the converse is not true. "If a student's true marks are just below the pass level in all subjects, his marks must have been underestimated in all of them and marks added to get him to pass. The use of the absolute system tends to give a high 'failing rate'."(Taylor)

A mark is a number intended to be a measure of the performance of a student. Hence it is possible for us to extend the theory of errors in measurements to marks as we do for other scientific measurements.

It may therefore be necessary to include in our specification of mark:

1. a numerical value (measurement)
2. a range of error on true score
3. probability of this error

The numerical value on its own does not indicate much, without implying the specifications 2 and 3, we must attempt to be explicit.

A mark differs from the physical measurements by having a wider range of uncertainty. There are many reasons for this; but two of these are important; firstly physical quantities like density and temperature are well defined.but the merit of an answer script is vaguely defined and difficult to specify precisely; secondly, the actual estimate cannot be made with accuracy. In measuring termperture of a substance the uncertainty may be less than one part in hundred, but the uncertainty in an examination mark may be 15% or more.

The Passing Probability

"It is usual to specify the error or uncertainty in the form of 'Standard Error'. This is simply a range which has the true value in it for every two out of 3 cases. If a particular examiners Standard Error is 3, he will make an error larger than 3 once in 3 times. He will also make an error larger than 6 once in 20 times and an error larger than 9 about once in 400 times. At the same time, the actual error he makes in any one case also is not known. All that we know about his Standard Error of 3 is the probability that the true mark will fall in a given range. As a particular case, we may find the probability that true mark will be above the pass line. This represents a range of values in which the chance of including the true value is approximately two thirds. What his actual error in a particular case is, can never be known, since we do not know the true mark he is aiming at. But we do know from the standard error, the probability that this true mark will fall in a given range. In particular, we can find the probability that the true mark will be above the pass line." (Taylor, Harper)

Consider an examination where the pass mark is 30 and the standard error of the examiner is 5. If the examiner assigns a particular mark to a candidate, what are the probabilities that the true mark is (a) above the pass line, (b) below the pass line? We shall call these numbers the "passing probability" and the 'failing probability'. These can be calculated as follows:
Table°

It is clear that even if the assigned mark is well below the pass level, there is still a chance that the candidate deserves to pass, and conversely, a high mark still makes it possible that he deserves to fail. This is in-built in the situation and this must be recognised. The marks can never indicate with absolute certainty whether a candidate deserves to pass or not. All that it can do is to indicate the probability that he deserves to pass. This information that marks give, must be made use of.

Let us go back. In the absolute system we compare the assigned mark of a student with a pass level and decide about his

---

°Table reproduced from H. J. Taylor & LN Tlunga Grace Marks - A study of the criteria for the adjustment of examination results. Gauhati Examination Research Unit, Gauhati University, 1963.

passing or failing. With the system of grace marks, we try to bring the assigned mark judiciously to the passing minimum. Both systems are to be abandoned, the former because marks are not absolute and the latter because gracing is adhoc. We must therefore use 'passing probabilities'. This original idea is due to H.J. Taylor who did pioneering work in this area.

If we consider a single students' single mark in a subject, the concept of passing probability has little meaning. On the other hand, if we consider his marks in different subjects, passing probability is a very useful concept.

Consider an examination in which two candidates A and B obtain marks in two subjects as 30 and 30 and 28 & 35. Under the absolute system A passes and B fails. In the grace mark system, if 2 marks are added to B for the first subject, he also passes. Let us look at the situation from the 'passing probability!

The probability of passing in 2 subjects is item product of the separate probabilities of passing in individual subjects. Having the data in Table I, we can therefore calculate for A, the total probability = 53.9 x 53.9 = 29.14%. For B, the total probability = 38.21 x 86.43 = 33.02%.

It is thus more probable that B, rather than A, has satisfied the requirement of passing in both subjects, B is therefore to be regarded as a better candidate than A and if A is to pass, B must also pass. Now consider an examination with 6 subjects.

Candidate A	30	30	30	30	30	30
Candidate B	47	40	50	25	28	29

Total probability for A = 54% x 54% x 54% x 54% x 54% x 54% =2.44%

Total probability for B =100 x 98 x 100 x 18 x 38 x 46 = 3.08%

Here again on the absolute system A passes while B fails; On the grace mark system, B must be given 5, 2, 1 additional marks in IVth Vth & VIth subject before he passes.

On the 'passing probability' criterion, B has a better passing probability than A.

If A is to pass, B must also pass. It should be emphasised again that in the case of B, we do not condone failure in 3 subjects because he has done well in the other three subjects. We pass B because it is more probable in his case that the true mark is above the pass line in all the six subjects. There is ample indication in these examples that this method provides a powerful technique for dealing with these problems. The new criterion of passing may be summarised as:

"Given any set of marks and an assumed or calculated value for the standard error of the examiner, there is a certain probability that the candidate, on true marking would pass in all subjects. All candidates should pass for whom this probability exceeds some specified value, usually the probability of obtaining minimum pass level in all subjects". (Taylor & Tluanga).

The requirement of a Minimum Total

It is sometimes insisted in examinations that the aggregate of marks in several subjects to reach a certain minimum total is a condition for passing Very often this is a supplementary condition. The total is a more reliable figure than any of the individual marks because the Standard Error of the total is smaller than the Standard Error of individual subjects. It can be said that four measurements are twice as good and nine measurements are 3 times as good.

At the same time, if marks in different subjects are not measures of the same thing, there is no justification in adding them.

Usually grace marks are added and never subtracted. Sometimes, grace marks added in certain subjects are taken away from the other subjects in order to make the aggregate total of the candidate to remain unaltered.

SECTION IV
MODERATION PROCEDURES

MODERATION PROCEDURES

'MODERATION PROCEDURES' ranging from adhoc, arbitrary methods to fairly statistical procedures as adopted by various universities/institutions in our country were presented in section two. Even a very casual glance through them is enough to make one form the opinion that the general practice in universities in respect of their public/mass conducted examinations is to distribute the answer scripts to various examiners for evaluation, with the head examiner trying to bring in the uniformity of marking. Quite often, there is no systematic marking scheme evolved and agreed upon by all examiners. Generally, a meeting of paper-setters/head examiners is convened to outline instructions to be given to the examiners. These instructions may not cover all the details and aspects of the answers and the marks to be given. Sometimes, the head examiner re-evaluates 5 to 20 sheets corrected by the examiners and returns them with his comments. This scheme does not work the way it should because of the subjectivity of examiners. Again, since the answer scripts are also not randomised (very few universities do this today), the uniformity of marking is further reduced. There are errors due to differing quality of answer - scripts to various examiners; (one examiner may be marking all scripts from a very good college while the other may have received all the scripts from a poor college.), something about 'randomisation' will not be inappropriate here.

'Randomisation' is the shuffling of answer- scripts of a particular paper in such a way that each examiner gets a 'random' set of scripts i.e. the scripts of a particular college are valued by many examiners for that paper. There are many ways to randomise scripts. Some of these are:

1) to renumber the scripts and remove the original numbers.

2) to give a mixed assortment of scripts to each examiner

(instead of a set in numerical order).

3) to give roll numbers at random and to arrange the scripts serially for examining.

4) to randomise on the basis of blocks (bundles) containing a number of answer scripts ranging from 20 to 50.

(1) This procedure is complex and liable to error in decoding and involves considerable delay in the publication of results. (2) has some disadvantages.[1]

The importance of this aspect of examination, in preventing post-examination malpractices can not be over-looked. Why should 'randomisation' be done? One obvious reason is security. In the past, before the introduction of randomisation and allotting of false numbers to scripts, examiners have always known where their scripts came from since the roll number of the candidates included the name of the centre. It was never difficult for a candidate to find out who was likely to examine his script. This led to the exertion of pressure and influence on the examiners by the examinees and their relatives. This can happen at any stage if the identity of the candidates is not effectively concealed. It is not our contention to show the extent to which corrupt practices occur but the advisability to adopt a process which would make them difficult if not impossible cannot be questioned.

The second reason for randomisation is more fundamental and based on the assumption that the examiners mark on different standards. There is a strong element of subjectivity. One examiner gives 40 marks where another may have given 30. These obvious large differences are owing to the difference in the standard of examining or the difference in the quality of scripts, we have no way to judge. Again, there are colleges with varying 'standards' and the scripts an examiner gets for evaluation may be better than those of another depending on the 'standard' of the college the scripts belong to. Now, if the scripts of a paper belonging to different colleges are thoroughly mixed, each examiner gets a sample more or less representative of the whole area, and all the bundles almost statistically equivalent. Any difference, after that, found in the level of marking, can safely be attributed to the examiners and not to the candidates. It is then possible to scale all marks to the same norm i. e. measuring the performance of all candidates on the same scale. An Analysis of marks, (initiated by university of Gauhati and followed by other universities) was done with randomised scripts of 250 each to 20 examiners. Variations in the median/mean were observed and it was found that pass percentages differed considerably due to the variation in standards of marking. It may be broadly true that extremely good candidates are likely to pass and very bad ones are likely to fail. But it cannot be denied that the great majority of candidates are more or less of average merit and the element of chance plays a large part in determining their results.

---

[1] A method of random roll numbers adopted by Gauhati University can be got from H.J. Taylor 'Operation Passmark' in the Management of Examinations, AIU, pp. 103 to 104.

It is an accepted fact and all the available evidence goes to prove it that large differences are invariably found and this forms an intrinstic part of essay type examination marking. We cannot ignore the fact that the examiners differ widely in their standard of marking. These differences are so large and so inherent in the situation that they invalidate the whole result of the examination. We have to recognise it and take it into account. As a matter of fact these differences should be measured and necessary and appropriate correctives should be applied. The best course is to 'scale' the marks. Marks from different examiners should be adjusted to a common standard, a procedure called 'scaling'. It has long been recognised as a necessary procedure for examination results. It means little or nothing when candidate A is judged on one standard and candidate B on another.

In scaling, the marks are raised or lowered until the median comes to the value chosen as The Norm. There are many possible ways of doing this, which differ in points of detail but give very similar results in practice. In the method used, the marks 100 and 0 at the ends of the scale are kept fixed, since these presumably represent perfection on the one hand and a blank paper on the other. If the median 30is raised to 36, all the marks between 0 and 30 are raised proportionately, so that 5 becomes 6 and 15 becomes 18. The same principle applies above the median. If 30 increases by 7 and 100 remains fixed, the intermediate marks change in proportion. Thus 40, increases by 6 to 46; 50 increases by 5 to become 55 etc. To carry out this scaling rapidly and accurately, printed tables are used (University of Gauhati; Scaling Table for Examination Marks) which give the scaled marks in terms of the raw marks for any given change of median.

Since there is no 'ideal standard examiner' (whose median could be accepted as a norm to scale other marks) the average of a large number of examiners is taken and thus, the average of all for a given subject (in a zone), is the most appropriate norm to use. If the marks are scaled to that norm then we are judging each candidate on the consensus of the opinion of many examiners, instead of on the possible erratic opinion of a single examiner.

Certain technical points however, will have to be considered. If the norm was obtained as the mean of several hundred examiners, its value would be very precise and accurate. In practice, the number of examiners is about 20, or less. The net effect is that there are additional errors to reduce the validity of the final results. It is considered that the job of the examiner is to estimate the merit of the scripts as carefully and consistently as possible on a scale natural to him. His marks can then be accepted as valid measures subject only to scaling requirements. Initially it was not possible to scale marks to a common standard, as the scripts were not randomised. After randomisation it can be done with a high degree of confidence.

It is also found that mark sheets from different examiners differ not only in the value of the median, but also in the range or spread of marks. Some sets of marks are closely concentrated around the median (the middle student's mark) and others extend over a wider range. The spread is measured by the standard deviation of the marks (approximately three-quarters of the inter-quartile range). In an ideal situation marks should be scaled so that all sets of marks have (1)the same mean or median, and (2) the same standard deviation. Of these (2) is more difficult.
A detailed procedure of different methods of scaling is given in Appendix A. pp.29, Monograph on Grading for Universities, AIU.

1. Arbitrary, Adhoc Moderation

Many universities have a procedure which involves addition of an arbitrary mark to every script around the pass/fail cut off point. Usually, the mark (called grace mark) to be added is determined arbitrarily and is even a particular percentage of pass is not the criterion. The grace marks added in one year have no relationship with what has been done in previous years. Very often, borderline cases are not re-evaluated. It is necessary that universities must put an end to this procedure of adhoc arbitary addition of marks.

2. Based on Sd/SEM

A better procedure adopted by some universities in recent years is to look at borderline cases both at the cut off of Pass/Fail and I/II divisions and apply a grace mark which bears a relation to the standard deviation of marks or more so to the standard error of measurement. It is found in a majority of cases that the standard deviation in a subject paper of maximum 100 marks has been around 10 marks and SEM nearly 2/3rds of sd= 7 marks. It can be argued statistically that one SEM can be the grace mark to be given to every borderline mark (thus if 35 marks is passing minimum all students' marks below 35 will be made into (this mark +7 marks) students marks between 35 and 100 will be proportionately increased)

SECTION V
COMPUTER PROGRAMME FOR MODERATION OF MARKS

COMPUTER PROGRAMME FOR MODERATION OF MARKS

The computer-programme written in FORTRAN IV can be used to find the passing-probabilities of the students based on their marks in various subjects or examinations. The decision pass/ fail is based on the comparison of his passing probabilityand the minimum passing probability, which is the probability of a student who scores just the minimum passing score in all the Examinations/ subjects as set by the university or the Board.

This method is based on the scientific and statistical probability results and hence objective. If the Board desires to grant success or the particular level of success to prespecified chosen number, it can definitely do this, as the student's marks in various fields have been quantified in a single number - passing probability, which are comparable figures.

As there is much evidence that the level of marking usually has the standard Error of 5 or 7. The programme has the facility to operate in either way as prescribed by the user.

DESCRIPTION OF VARIABLES USED AND DATA CARDS

DATA CARDS

I. The program reads the control card which is as follows.

Column	Variable name used	
1-2	CODE 1	Punch 05 if S.E. of MARKING 5 is to be used. Punch 07 if S.E. of MARKING 7 is to be used.
3-4	CODE 2	Punch 01 if Pass/Fail probability table is not to be printed. Punch 02 otherwise.

5-6	CODE 3	Punch 01 if Roll numbers are there and has to be read by the computer. Punch 02 if Roll numbers are not given but has to be given according to the serial number.
7-8	NE	Punch the Number of Examinations.
9-13	NS	The number of students.

II. The card giving the passing-marks for each of the NE examinations in the FORMAT F 6.1

III. NS Data Cards: Ist Card should give the marks of I^{th} student in all the NE examinations in the FORMAT F 6.1.

IV. If CODE 3 is 1 then this card has to be there otherwise not, if present it should give the roll numbers of each of the NS students in the FORMAT 26 I3.

V. There should be 100 cards giving the values of the Pass/Fail probability Table with S.E. of marking 5 or 7 depending on the value of CODE 1.

VARIABLES USED

SE	Matrix containing pass/fail probability table.
PM	Vector of Passing Marks in each examination.
AMARKS	Martix whose i^{th} row gives the marks of the i^{th} student in the examinations/subjects.
ROLL NO.	Vector giving the Roll-numbers of the students
MR, IPM	Working Vectors.
NE	The number of Examinations.
NS	The number of students
PPM	Minimum passing probability
PP	Passing probability
PF	Failing probability

MAIN PROGRAMME

```
         INTEGER CODE 1, CODE2, CODE3, ROLI NO, SE
         DIMENSION SE (100, 38)PM (10),AMARKS(500, 10),ROL LNO (500)
         DIMENSION  MR(10), IPM (10)

         DATA PASS/ 'PASS' /, FAIL / 'FAIL' /

         READS THE CONTROL CARD AND INPUT DATA CARDS

         READ 1, CODE 1, CODE 2,  CODE 3, NE, KD, NS

1.       FORMAT (5 I 2, I4)
         READ 3, (PM (J), J = 1, NE)
         DO 2 I = 1, NS

2.       READ 3, (AMARKS (I, J), J = 1, NE)

3.       FORMAT (10 F 6.1)
         IF (CODE 3.EQ.1) GO TO 21
         DO 11 I = 1, NS
11.      ROLLNO (I) = I
         GO TO  2
21       READ 12, (ROLL NO (I), I = 1, NS)

12       FORMAT (26 I 3)

         CHECKS FOR THE S.E.

         IF (CODE1.EQ.5) GO TO 4
         READ 60, ((SE (I,J), J = 1, KD), I=1, 100)

60       FORMAT (36 I2)
         K = 20
         GO TO 81

4        READ 61, ((SE (I,J), J = 1, KD), I=1, 100)

61       FORMAT (26 I2)
         K = 15

         CALCULATES THE PROB. AND PRINTS THE OUTPUT
           L = K - 2
           PRINT 500
           IF (CODE 2.EQ.1) GO TO  81

         CALL HEAD (CODE 1, L, SE, KD)

81       PRINT 501, CODE 1, NE, NS

501      FORMAT (//, 16x, 'STANDARD ERROR OF MARKING = ' I4, //,
         16x, 'NUMBER OF EXAMS', '=', I4, //, 16x, 'NUMBER OF
         STUDENTS', 8x '=', I6)
```

```
           DO 502 I = 1, NE
           MR (I) = PM (I)
502       PRINT 503, I, PM (I)
503       FORMAT (//, 16x, 'PASSING MARKS IN EXAM NO', I3, '=', F6.1)
           CALL PAPR (NE, L, MR, SE, PM, K, PP, PF)
           PPM = PP
           PRINT 504, PPM
504       FORMAT  (////, 16x 'MINIMUM PASSING PROBABILITY = 1', F10.4,
          1 '%')
701       FORMAT (//, 52x, 'DECISION-TABLE', ////)
          PRINT 702 (I, I = 1, NE)
702       FORMAT ( //, 4x, 'ROLLNO/', 2x, 'PASSING' 9x, 'FAILING',
          ix, 'DECISION'
     1    ,6x, 'EXAMNUMBER', /    'S.NO.', 2x, 'PROBABILITY', 5x,
          PROBABILITY',
     2    5x, 'PASS/FAIL', 10I5)
            DO 71 I = 1, NS
            DO 83 J = 1, NE
83        MR (J) = AMARKS (I, J)
            CALL PAPR (NE, L, MR, SE, PM, K, PP, PF)
            IF (PP. GT. PPM) GO TO 9
            PRINT10, ROLLNO (I), PP, PF, FAIL, (AMARKS (I, J),
            J = 1, NE)
          GO TO 71
9         PRINT 10, ROLLNO (I), PP, PF, PASS, (AMARKS (I, J), J = 1, NE)
10        FORMAT (4x, I8, Z (F10.4, '%'), 11x, A4, 10F7.1)
71        CONTINUE
          END
```

NOTE : - FORMAT and DIMENSION statements have originally been written for 10 exams/subjects and 500 students, In case of any change in these statements have to be changed appropriately.

SUBROUTINE TO PRINT PROBABILITY TABLE

```
          SUBROUTINE HEAD (CODE 1, L, SE, KD)
          DIMENSION SE (100, 38)
          INTEGER CODE 1
          PRINT 800, CODE  1
800       FORMAT (24x, 'EXAMINATION PASSING PROBABILITY : STANDARD
          ERROR
```

```
    1    OF MARKING' I3, ////, 10x, 'MARKS BELOW PASS LEVEL', 12x,
         'PASS', 17x,
    2    'MARKS ABOVE PASS LEVEL', // 44 x, 'MARK', ////)
         PRINT 801
801      FORMAT (65 (2H--))
         LP  = -L
802      FORMAT (//, 5x, 37 I 3, ////)
         PRINT 801
         DO 10I=1, 100
         PRINT 803, (SE(I, J), J = 1, KD)
803      FORMAT (//, 2x, 38I3)
         PRINT 801
         RETURN
         END
```

SUBROUTINE TO CALCULATE THE PASSING PROBABILITY

```
         SUBROUTINE PAPR (NE, L, MR, SE, PM, K, PP, PF)
         DIMENSION SE (100, 38), PM (10), MR (10), IPM (10)
         INTEGER SE
         ICD = 0
         DO 1 I = 1, NE
         IPM (J) = PM (J)
         LP = -L
         IP = MR (J) - IPM (J)
         IF (IP. GT.  L) IP = L
         IF (IP .LT.  LP ) IP = LP
         IB = IP + K
         IF (J.EQ.1)  LA = 1
         IA = SE (LA, IB)
         IF (IA. GT. 10) GO TO 2
         IA = IA * 10
         ICD = ICD + 1
    2    LA = IABS (101 - IA)
    1    CONTINUE
         AI = IA
         DE = 1.
         IF (ICD. EQ.0)GO TO 4
         DO 10 J = 1, ICD
10       DE = DE * 10
    4    PP = AI / DE
         PF = 100.- PP
         RETURN
         END
```

OUTPUT SAMPLE

We have used the raw scores of 10 students with 5 Exams. The output received for S.E. of making =5 is as follows.

```
STANDARD ERROR OF MARKING            =  5

NUMBER OF EXAMS                      =  5
NUMBER OF STUDENTS                   =  10
PASSING MARKS IN EXAM NO. 1          =  35.0
PASSING MARKS IN EXAM NO 2           =  35.0
PASSING MARKS IN EXAM NO 3           =  35.0
PASSING MARKS IN EXAM NO 4           =  30.0
PASSING MARKS IN EXAM NO 5           =  25.0


MINIMUM PASSING PROBABILITY          = 4.9000%
```

DECISION - TABLE

ll No/ No.	Passing Probability	Failing Probability	Decision Pass/Fail	Exam Number 1	2	3	4	5
1	1.9000 %	98.1000 %	FAIL	37.0	33.0	38.0	28.0	21.0
2	0.5700 %	99.4300 %	FAIL	23.0	26.0	39.0	34.0	29.0
3	0.0510 %	99.9490	FAIL	16.0	27.0	36.0	35.0	34.0
4	0.7400 %	99.2600	FAIL	29.0	26.0	38.0	37.0	35.0
05	24.0000 %	76.0000 %	PASS	38.0	35.0	37.0	36.0	33.0
06	42.0000 %	58.0000 %	PASS	39.0	37.0	38.0	39.0	36.0
07	6.0000 %	94.0000 %	PASS	36.0	38.0	37.0	36.0	20.0
08	0.1000 %	99.9000 %	FAIL	33.0	37.0	36.0	22.0	18.0
09	0.8000 %	99.2000 %	FAIL	43.0	41.0	63.0	22.0	19.0
10	1.0000 %	99.0000 %	FAIL	40.0	38.0	37.0	26.0	17.0

BIBLIOGRAPHY

BIBLIOGRAPHY

1. Abraham, A.S. "Examination reform: Improving the External Test". Times of India, New Delhi. 18 Oct 73.

2. Agrawal, N.C. "Moderation : Views and Suggestion". In Inter University Board of India and Ceylon, Examinations in Higher Education: Report of a Seminar, New Delhi 1971, New Delhi, Author, 1971: 47-48.

3. Airan, J.W. "System of Examinations". Hitvada. 27 March 73:4.

4. Aiya, S.V.C. "A Question Bank to Solve Examination Problems". Hindu. 7 Sept., '73.

5. Akaydee. "Should we change the examination system"? Amrit Bazar Patrika. 12 Sept., '72:4.

6. Amrik Singh. "Examination : The strategy of change". New Frontiers in Education. 3(2); Aug. 73: 74-91.

7. Amrik Singh. "Mechanical Aids In Examinations". University News. 9(4); Apr. '71:3.

8. Association of Indian Universities. Monograph on Grading for Universities. New Delhi, Author, 1976.

9. Balst, Mayah "No examinations: Bane or boon?" Times of India, New Delhi. 12 Sept. '79 : 8.

10. Banerjee, Anil Chandra. "Examinations and their reforms." Amrit Bazar Patrika. 5, May '70:6.

11. Baqer Mehdi. "Role of Examinations in Guidance". New Education. 8(2); Sept. '56 : 53-56.

12. "Basic change in the examination system". University News. 12(9); Sept. '74:16.

13. Bhatia, P.K. "Students and examinations". Teachers' Journal 28: Aug-Sept '50: 304-10.

14. Bhumij, H. "Question setting and moderation". In Inter University Board of India and Ceylon. Examinations in Higher Education: Report of a Seminar, New Delhi, 1971 New Delhi, Author, 1971: 49-50.

15. Biswas, M. "Examinations and their problems in India". Indian Education. 7(6-7); May-June 68:4-17.

16. Bose, P.K. "Are examinations world wide: A statistical evaluation". Science and Calcutta. Oct '65.

17. Burn, R.P. "Question setting and instructional objectives". In Inter University Board of India and Ceylon. Examinations in Higher Education: Report of a seminar, New Delhi, 1971. New Delhi, Author, 1971:5-7.

18. Chagla, M.C. "Examinations". Maharashtra Educational Journal. 12(4); Jan 64:93.

19. Chaitanya. "Assessment of students: A New Approach". Education Quarterly. 24(2); July '72:15-17.

20. Chaitanya. "Should examination system go?" Assam Tribune. 7 Nov., '71:4.

21. Chaturvedi, Vipula and Chaturvedi, M.C. "Examination reform in higher education in India". Educational Quarterly. 24(2); July 72: 27-32.

22. Chaube, S.P. "Problem of examination system". Indian Education. 7(6-7); May-June 68: 18-20.

23. Chauhan, D.S. "A study of the university examinations". In R.H. Dave, and P.M. Patel, Educational evaluation and Assessment, New Delhi, NCERT, 1972:206-36.

24. Dandapani, S. "An examination of examinations". Educational

India. 36(5); Nov. '69: 161-63.

25. Dandekar, W.N. "Some thoughts on the examination system". Progress of Education. 32(2); Sept. '57:52-55.

26. Dave, R.H. and Patel, P.M. Educational evaluation and assessment. New Delhi, NCERT.

27. Dave, R.H. and Srivastava, H.S. "Decade of examination reform in India". N.I.E. Journal 3(6); July 69:69-76.

28. Desai, D.M. "Brief history of the movement for examination reform in Indian University". Education and Psychology Review. 10(3); July '70: 173-78.

29. Desai, D.M. "Designing of question paper." In Inter University Board of India and Ceylon. Examinations in higher education: Report of a seminar, New Delhi, 1971. New Delhi, Author, 1971:8-13.

30. Desai, D.M. "Examination reform in higher education in India". Education and Psychology Review. 11(2-3); Apr.-July '71: 51-59.

31. Duggal, S. L. "System of internal assessment in education". University News. 6(11); Nov. 68:14-18.

32. "Educational innovations at BITS". University News. 13(12); Dec. 75:17.

33. "Examination reform to improve education". Hindu. 30 Sept. 66, 6.

34. "Examination system to be modified". Times of India, New Delhi. 8, Jan 72:4.

35. Gayen, A.K. "Question setting and moderation". In Inter University Board of India and Ceylon. Examinations in higher education: Report of a seminar, New Delhi, 1971. New Delhi, Author, 1971: 39-46.

36. Gayen, A.K. and Philip, P.J. "Survey of examinations in

Indian Universities". Indian Journal of Educational Administration and Research. 2(3-4); Winter 61-Spring 62: 1-18.

37. "Grace marks " Hindustan Times. 4, Oct. '72:5.

38. "Grading system". Amrit Bazar Patrika. 29, Dec.'73

39. "Grading system to replace marks in examinations". Indian Express. 9th July '75.

40. Gupta, R.S. "How to improve present system of examination". Education Review. (57) Sept. 51: 169-73.

41. Gupta, S.C. "Conversion of marks into grades: A comparative study". University News. 14(10): Oct '76: 9-11.

42. Handbook of mental measurement. New Delhi, NCERT, 1966.

43. Harper A. Edwin. "Educational testing: Relevance to India". In Inter University Board of India and Ceylon. Examinations in higher education: Report of a seminar, New Delhi, 1971 New Delhi, Author, 1971: 41-45.

44. Harper, A. Edwin. "Examinations: Some practical hints". New Frontiers in Education. 2(1); Apr.-July '72:50-66.

45. Harper, A. Edwin. "Translating marks into grades". University News. 13(5); May 75: 8-9.

46. Harper, A. Edwin. Jr. and Misra, V.S. Research on examinations in India, New Delhi. NCERT, 1975.

47. Hill, Walker H. "Marking, scaling, and grading". In Bhopal University, Seminar on examination reform: Report Bhopal, Author, 72, 55-70.

48. Hopper, W.A.F. "Question paper setting: A practical approach". Educational India. 30(10); Apr. '64: 347-53.

49. Janki Das and Sharma I.P. "U.G.C. On examination

reforms; A Critique". University Affairs, Delhi. 2;Jan-Feb. '75:17-19.

50. Jayasuriya, J.E. "Examination design". In Inter-University Board of India and Ceylon. Examinations in higher education: Report of a seminar, New Delhi, 1971. New Delhi, Author, 1971: 26-29.

51. Julka, Satya Pal. "Examination reforms-IV: Some Proposals" University Affairs. 3(8); 15 Aug.-15 Sept '76:9-12.

52. "Marking Papers". Times of India, New Delhi. 8 Oct. '71:6.

53. Misra, V.S. "Border line cases in examinations". In Inter University Board of India and Ceylon. Examinations in higher education: Report of a seminar, New Delhi, 1971, New Delhi, Author, 1971: 157-63.

54. Mitra, Shib K. "Examination Research Unit". In Inter-University Board of India and Ceylon. Examinations in higher education: Report of a seminar, New Delhi, 1971, New Delhi, Author, 1971:245-50.

55. Natarajan, V. "Continuous assessment of technician student performance". Education Quarterly. 23(2); July 71:41-44

56. Natarajan, V. "Evaluation and measurement in technical education". Technical Teacher. 8;1974;20-24.

57. Natarajan, V. "Evaluation of examinations scores". Technical Teacher. 7;1973:57-62.

58. Natarajan, V. Examination reforms; programmes and its outcomes. University News. 14(1); Jan 76:22-23, 25.

59. Natarajan, V. "New method of construction of practical examinations in surveying". Journal of Educational Research and Extension. 9(3); Jan. '73.

60. Natarajan, V. "Question Banks: Their use in Indian Examinations, New Frontiers in Education. 5(3); July-Sept. 75: 64-71.

61. Natarajan, V. and Ved Prakash. A new approach for the construction of practical/laboratory/field work examination. New Frontiers in Education, Vol. VII, No. 3, July-Sept. 1978.

62. Natarajan, V. and Ved Prakash. Towards a sceintific design of internal assessment in school courses. School Education, Vol. IV, No. 1, 1978.

63. Padmanabhan, N. S. "Examination: A bottleneck in education". Educational India. 30(10); Apr. '64:375-76.

64. Pattabhiram, M. "Making examinations more meaningful". Hindu. 29 July, 71:8.

65. Raina, T. N. "Relationship between external examinations and internal assessment". Teacher Education. 8(1); July 63;25-38.

66. "Rajasthan varsity to have grading system". Hindustan Times. 14, July '75.

67. Singha, H. S. "Declining ethics of examinations" University News. 12(7); July 74:3-6.

68. Singha, H. S. "Improving university examination". In Bhopal University. Seminar on examination reforms: Report. Bhopal, Author, 1972; 41-49.

69. Singha, H. S. Modern educational testing, New Delhi, Sterling, 1974.

70. Srinivasan, R. "Grading". In Inter University Board of India and Ceylon. Examinations in higher education: Report of a seminar, New Delhi, 1971, New Delhi, Author, 1971:64-68.

71. Srivastava, H. S. "Trends in examination reform in India." N.I.E. Journal. 6(6); July 72:1-7.

72. Taylor, H. J. Examination of Examiners: A study of the reliability of examination marking. Gauhati, Examination

Research Unit, Gauhati University, 1962.

73. Taylor, H.J. Three studies in examination technique. New Delhi UGC, 1964.

74. Taylor, H.J. and Tluanga, L.N., Grace marks: A study of the criteria for the adjustment of examination results. Gauhati, Examination Research Unit. Gauhati University, 1963.